

ECOSYSTEM STATUS INDICATORS

Herring

Southeast Alaska Herring

Sherri Dressel, Kyle Hebert, Marc Pritchett, and David Carlile – Alaska Dept. of Fish & Game –(907) 465-6146; sherri_dressel@fishgame.state.ak.us

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Herring stock assessments have been conducted each fall by the Alaska Department of Fish and Game at nine spawning areas in Southeast Alaska for most years since 1980. Recurrent, annual spawning and biomass levels have warranted yearly stock assessment surveys, and potential commercial harvests, at these locations during most of the last 22 years. More limited spawning occurs at other locales throughout S.E. Alaska. However, other than aerial surveys to document shoreline miles of spawning activity, little stock assessment activity occurs at these locations. Spawning at the nine primary sites for which regular assessments are conducted have probably accounted for 95-98% of the spawning biomass in S.E. Alaska in any given year.

Herring spawning biomass in S.E. Alaska often changes markedly from year to year, rarely exhibiting consistent, monotonic trends (Figure 51). Since 1980 seven of the nine primary locations have exhibited long term trends of at least slightly increasing biomass, one area (Craig) has not shown any long term trend, and biomass in one area (Kah Shakes/Cat Island) has had a pronounced downward trend. There have been major fluctuations around these long-term trends with periods of both increasing and decreasing trends over the shorter term. Since 1997, southeast Alaska spawning herring biomass has been above the long-term median of 75,299 tons (1980-2003; Figure 51). The 2001 and 2003 estimates of spawning biomass were the highest of the 24-year time series (Figure 51). Since 1980 herring biomass at Sitka has contributed 37 to 64% (median: 56%) of the total annual biomass among the nine spawning locations. Excluding the Sitka biomass from a combined estimate, S.E. Alaska herring biomass has generally been above the 24-year median since 1997 (except in 2000).

There does not appear to be clear decadal-scale variability of age-3 herring recruit abundance, in the three widely recognized climate-regimes in the North Pacific: 1978-1988, 1989-1998 and post-1998. The number of age-3 recruits has been estimated for Kah Shakes-Cat Island, Craig, Seymour Canal, Sitka, and Tenakee Inlet for most years since 1980. The number of age-3 recruits has been estimated for West Behm Canal, Ernest Sound, Hobart Bay-Port Houghton and Hoonah Sound for most years since 1995. Overall recruit abundances were highest in 1980, 1987, 1991, and 1996; however, this pattern was not consistent across all spawning locations, and recruit estimates were not available for all areas in all years. Only one stock, Kah Shakes/Cat Island, showed a distinct decreasing trend in recruit abundance over time. The recruit abundance of Sitka herring, the stock with the greatest annual recruit abundance, was above the 24-year median in 8 out of the last 9 years.

There has been some speculation and debate about the extent to which commercial harvests may have contributed to marked declines in abundance and/or localized changes in herring spawning sites in a few areas in S.E. Alaska, notably Revillagigedo Channel (Kah Shakes/Cat Island) and Lynn Canal. Some spawning areas are sufficiently close to one another so interannual movement between areas may also contribute to year-to-year fluctuations in local abundance. In the Revillagigedo Channel area, significant spawning and a fishery occur at Annette Island, a site outside the management jurisdiction of the State and from which limited data are gathered by the department. Although spawning activity at the Kah Shakes and Cat Island sites in Revillagigedo Channel has declined in recent years, this decline may be at least partially attributable to a shift in spawning grounds to Annette Island, bordering Revillagigedo Channel.

A threshold management policy in S.E. Alaska allows for harvests ranging from 10 to 20% of forecast spawning biomass when the forecast biomass is above a minimum threshold biomass. The rate of harvest depends upon how much the forecast exceeds the threshold. Consequently, catch, at most areas, has varied roughly in proportion to forecast biomass (Figure 51).

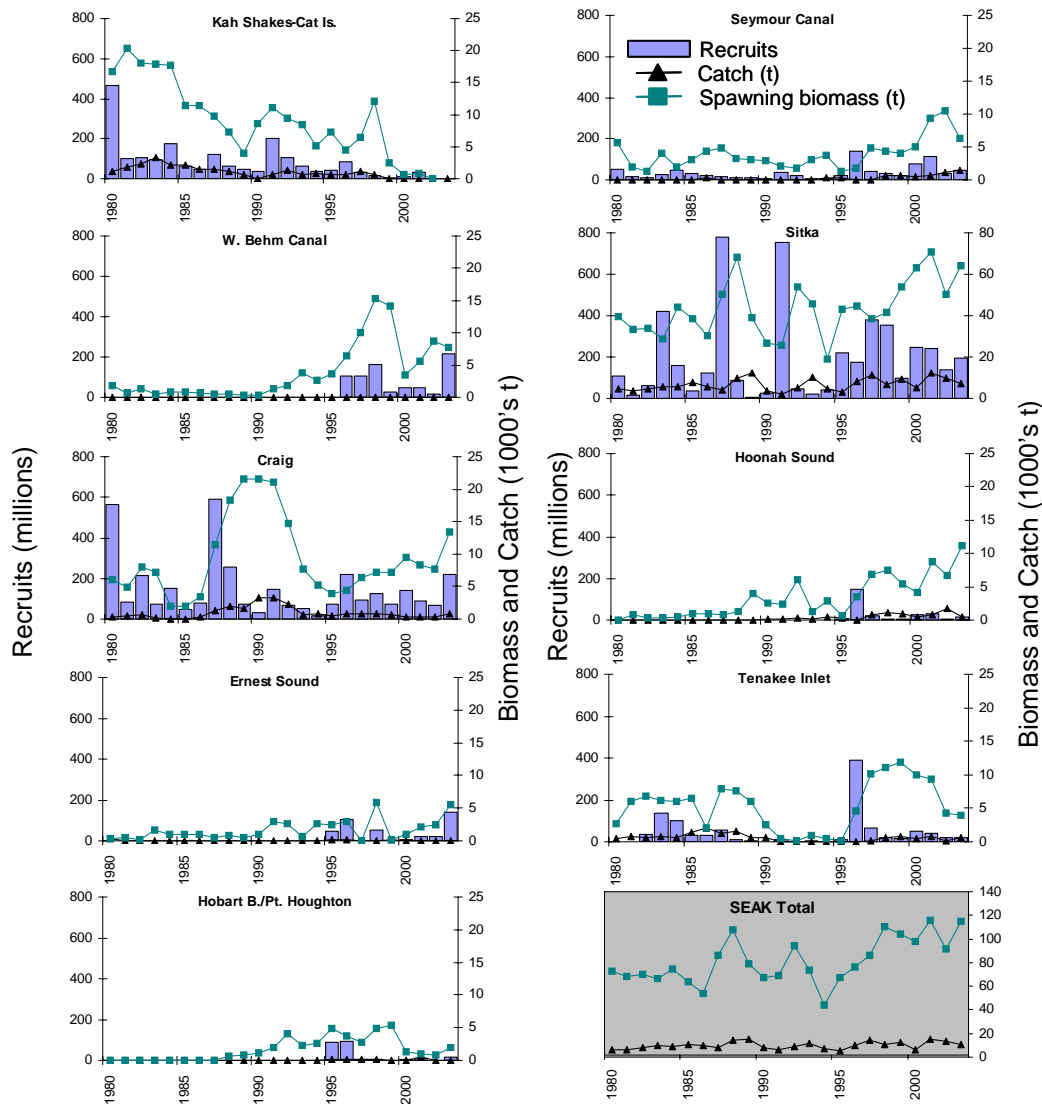


Figure 51. Estimated herring spawning biomass (tons), catch (tons), and age-3 recruits (millions of fish) in nine areas of S.E. Alaska, 1980-2003. Total biomass and catch for southeast Alaska (SEAK) is shown (bottom right panel). Recruits were not estimated in all years in all areas; therefore, missing values may not be zero estimates.